

# Ghadar Jari Hai

The Revolt Continues

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## Relevance of *Arthashastra*

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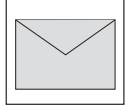
Surkhraj Kaur, Santosh, Anand

### **Editorial Policy**

Ghadar Jari Hai is a platform for discussing Indian solutions to problems facing India. It is focused on understanding Indian history, philosophy and economic, political and other fields of knowledge, without the jaundiced eye of Eurocentrism.

All serious views, of whatever hue, are welcome as long as the author substantiates his or her argument and does not indulge in labeling, name calling and ridicule. We are particularly interested in unraveling pre-British India and the changes brought about through British rule, since the colonial legacy continues to bear great significance for present-day Indian society. We believe that no shade of opinion has a monopoly over the truth and that if we all collaborate in this endeavour, we are quite capable of arriving at insights and solutions to our problems, much as our ancestors did. We seek to publish well researched articles in various fields, which at the same time are communicative and do not indulge in excessive technical jargon.

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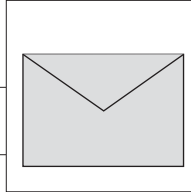


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## Letters to the Editor

Dear Editor,

The 2009 election manifesto (<http://www.aicc.org.in/new/home-layout-manifesto.php>) of the Congress Party states, “Balance—or the middle path—has always been the hall-mark of the policies of the Indian National Congress.” It then goes on to mention how the balance between the public and private sector, organized and unorganized sector, urban and rural needs, regulations and entrepreneurship has stood India well in this time of global crisis.

“Middle Path” conjures up images of harmony and of the little snippet of Buddhism we are taught in school about Buddha’s discovery of the Middle Path as the road to ending human suffering. So it is perhaps instructive to examine what the Middle Path really means and if the Congress party’s manifesto fares well in that regard.

Buddha’s Middle Path was a radical middle – a clean break from all the existing philosophies of its time. It is about seeing reality as it is – interdependent and ever changing. This Middle Path wasn’t some comfortable mixture of everything India’s religions had to offer about salvation, nor was it something which avoided taking a stand on difficult subjects. It railed against false dichotomies that were prevalent then and sought a way to transcend these in a way that was scientific in its rigor, internally consistent in its logic, practical in its emphasis and ultimately about compassion for all.

In many ways, the Congress party’s middle path has a long history of doing the exact opposite of what Buddha taught. Let’s go back to the early days of India’s independence when the party and the country proclaimed themselves non-aligned not wishing to antagonize the Soviet Union or the West, cutting deals with both, which ultimately were not in the interests of the common Indian. Buddha had to confront philosophers like the skeptic Sanjaya Belatthiputta who wasn’t willing to take a stand on any issue. Buddha and his followers called them “eel wrigglers”. So the Buddhist Middle Path clearly wasn’t about saying “Yes” to all sides or asserting that every side had something to offer.

The Middle Path of Buddha was about avoiding the extremes – the extremes of asceticism and drowning in sensual pleasure for example. But it wasn’t about artificially created opposites. Why for example should there

be a balance between the organized and unorganized sector? Shouldn’t the goal be to not have an unorganized sector at all, so that those in the unorganized sector have some bargaining power to earn a living wage?

The Middle Path teaches that it is an interdependent world. No matter how brilliant an idea an entrepreneur may have no wealth will be created by him unless there are workers who toil to bring those goods to the market place. Each needs the other and ultimately it is about balancing the needs of innovators and the workers. But the Congress party’s manifesto seems to give the impression that it is entrepreneurs alone that create wealth and it is simply about “regulating” them.

There are indeed many and sometimes conflicting demands that various groups place on society. Sometimes there are no easy answers and only a vigorous debate can resolve what it means to achieve balance. But it most certainly isn’t about balancing the needs of urban and rural India or any of the other conflicts suggested in the Congress Party’s manifesto.

R Chari  
New York

Dear Editor,

Thank you for the issues of Ghadar Jari Hai. Its contents are provocative and fresh and I am moved by your passion for clarity and rationality as much as for justice and equality.

Girish Karnad  
Bangalore

Dear Editor

Recently I got to know about GJH. The issues really made for very interesting and thought provoking reading.

It is indeed the need of the hour for us to rediscover our history and our heritage. But here again we should be careful about two things. Firstly in the process of de-Europeanising or de-Westernising ourselves, we should not indulge in bashing everything Western. At the same time while rediscovering ourselves we should not slip into glorifying all that goes in the name of Indian culture.

Regards  
Dr Sanjeev Kulkarni  
Dharwad



# Editorial

“Governance” is a trendy concept today. Governments, corporates, politicians and bureaucrats talk about it passionately. Institutions such as the World Bank have been researching on developing indicators to measure the quality of governance in a country. Now and then countries are rated and placed on a governance ladder which smells a little like ‘teaching these natives the values of civilized society’. But all the talk about governance reform doesn’t seem to have made even a bit of a difference to the performance of state institutions in India. In this issue, Udayan tries to analyse the reason for the yawning gap between the expectations of people and the performance of state institutions. While doing this he compares today’s constructs, rooted in the colonial past, with the classical Indian conception of governance as a dyad of rights and duties, brilliantly portrayed in Kautilya’s *Arthashastra*.

Is science a European enterprise, while spirituality and mysticism that of the East? If you believe most science historians and the traditional history taught in schools then it seems so. Scholars like Joseph Needham and D P Agrawal have tried to point out the truly global nature of the development of science and technology through meticulous research. This issue’s *Peepul ke Neeche* carries an eye-opening interview of C K Raju who has written several authoritative works on the ancient traditions of Indian mathematics. Raju establishes the historical exchanges between India, Persia, Arabia and Europe from the time of Alexander or even earlier. Also he contrasts the Indian way of looking at mathematics as a tool for solving practical problems, as opposed to the rigid metaphysical approach that evolved in Europe.

There is a tendency among researchers to focus on documented knowledge. However a lot of knowledge of nature, materials and technique exists in rural communities and tribes in oral forms or even in the form of myths

and legends. D P Agrawal exposes the weaknesses of this over emphasis on the written ‘*shastras*’ while ignoring the *desi* or folk knowledge systems. He gives many examples of the same from the central Himalayan region of Uttarakhand.

In the section *Jewels of India*, Shivanand Kanavi exposes us to *Sarvajanya*—a radical poet who strode through Karnataka five hundred years ago.

In the concluding part of his reminiscences, Salvinder Dhillon continues to reflect on his unsettling experiences as an Indian immigrant in the UK and his confrontations with prejudiced colonial history.

In the Travelogue section, S Raghavan transports the reader to the ancient city of Xi’an -- located on the romantic Silk Route. He points out that several centuries back relations between India and China, the two great civilisations of the time, were marked by mutual respect and exchange of goods and ideas.

In the *Books* section, Shivanand appreciates a play by Girish Karnad in Kannada on the great warrior king Tipu Sultan.

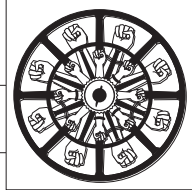
Inspired by the interview on “British colonialism and the Indian legal system” carried in the previous issue of this magazine, S Raghavan weaves a short story on dispute resolution in the *Pandya* kingdom several centuries back.

The last page carries poems of Akka Mahadevi from 12th century Karnataka.

We have strived to make this issue too as provocative and enlightening as previous ones. You could write your feedback to [jarihai@ghadar.in](mailto:jarihai@ghadar.in)







Cover Story

# The relevance of *Arthashastra*

*India has achieved a relatively high economic growth rate and wants to be a leader among nations. However, her performance in delivering basic services to citizens is pathetic. Governance experts fail to provide a convincing diagnosis of the growing gap between what the state delivers and what people expect it to deliver.*

*In one form or another standard western prescriptions of 'governance reform' are advocated. What exists is a colonial construct, which is in irreconcilable conflict with the Indian conception of rights and duties. To move forward we need to learn from Indian experience in statecraft, and Chanakya-Kautilya's *Arthashastra* is a valuable classic in this regard, notes*  
**S Udayan.**

India is among the top five countries today in terms of the rate of GDP growth, but it lags far behind other countries in providing quality education and health care to the population. India lags behind even its much smaller neighbours on this count, not to speak of the more advanced countries. It is well behind Sri Lanka in most social indicators. It is also way below global standards in maintaining public productive assets such as roads, buses and water pipes.

Numerous scholars and journalists have highlighted the glaring gap between word and deed in India today – between budgetary outlays and developmental outcomes, between what is recorded in official documents and the ground reality. One may call this the Governance Deficit. A few illustrations will help to explain what this means.

Hordes of data on rising numbers of schools, teachers and education budgets hide the fact that little or nothing is learnt in most government funded schools. Data on the number of public hospitals, rural health centers, doctors and nurses, hide the fact that conditions in the majority of public facilities are so bad that whoever can afford it goes to private doctors and clinics. Policemen more often flout the laws for personal gain than defend them for the greater common good.

While there is no dearth of descriptions of the miserable state of governance, there is a shortage of convincing diagnosis. Governance experts of the World Bank, for instance, say there are numerous weaknesses

in the “institutions of accountability”. Solutions are advocated based on the presumption or prejudice that what worked in Europe and North America in the 19th and 20th centuries is best for India in the 21st century.

What really is the root cause of the governance deficit? Why does the delivery of public services in modern India appear as mimicry, an imitation of something it is not, while the real business in government departments is largely off the record? What accounts for this two-faced character of the Indian state and its delivery mechanisms?

In order to address these questions, one has to look at the origin and metamorphosis of the present day State in India, and its relation to the conception of right and duty ingrained in Indian minds, a residue of millennia of indigenous experience with statecraft prior to the colonial conquest.

## Duties of the State in pre-colonial India

It is useful to study how one authoritative treatise on statecraft, viz., the *Arthashastra*, defines the duties of the State. In this article all references are to 'The Kautilya *Arthashastra*: An English translation with critical and explanatory notes', by R P Kangle, University of Bombay, 1972.

According to the *Arthashastra*, which is between 2000 and 3000 years old, the *karman* or mandatory obligations of the State (Chapter 2.1, 2.1.1, 19-20) include the following:

- *Sunyanivesana* – settlement on virgin land

- *Setubandha* – building of dams, tanks and other irrigation works
- *Vraja* – providing pastures for cattle
- *Vanikpatha* – opening trade routes and ensuring safety on them
- *Khani* – working on mines.

There is a conception of reciprocal rights and duties embedded in the relationship of the State to those who till the land, those who rear cattle, conduct trade, work the mines, or in short, the members of society engaged in producing material wealth. The State is duty bound to ensure the conditions necessary for the producers of wealth to play their role, and in turn has the right to collect a portion of the product as its revenue. The producers, on their part, have the right to receive state support in the form of secure land allotments, irrigation facilities, pasture lands, safe trading routes, etc. They are duty bound to turn over a prescribed portion of their product as revenue to the State.

In its elaboration of how the ruler should deal with the allocation and use of land, the *Arthashastra* says, in Chapter One of Book Two:

- He should allot to tax-payers arable fields for life;
- Non-arable fields should not be taken away from those who are making them arable;
- He should take away fields from those who do not till them and give them to others;
- Or village servants and traders should till them;
- Or those who do not till them should make good the loss to the treasury.

Here again, the confluence of right and duty can be seen. Land can be taken away from one who is not

performing his duty of tilling it, but not from one who is performing one's assigned duty. It is explicitly stated that land cannot be taken away from someone who is performing such a socially useful thing as converting Non-arable into arable land.

With respect to trade, whether domestic or foreign, the *Arthashastra* prescribes the principle of *prajanam anugrahena*, meaning that the people must benefit by such trade. It is explicitly laid down that any profit by individuals that may be harmful to the people as a whole should be avoided (2.16, 4-6).

It is interesting to note the elaborate procedures advocated by the *Arthashastra* for the selection of important ministers, including tests that involve secretly instigating them and seeing if they fall for the bait of corruption or remain loyal to their duty.

History has produced kings and public authorities that acted according to the rules of *raj dharma*; such kingdoms tended to last long, bringing relatively greater prosperity and progress. There were kings who violated these rules, those who neglected public irrigation works, levied onerous revenue obligations on the producers, or drained the treasury through costly military adventures beyond their means. Such kingdoms faced rebellions and instability, and went into decline sooner rather than later.

Thus, as time passed and as centuries of historical experience was summed up by the learned, works such as the *Arthashastra* gained respectability and the status of political theory, or *raj dharma*.

### Statecraft in the colonial period

Political theory and the fate of kingdoms were in a state of flux in this sub-continent when the East India Company began to entrench

itself. As the Company conquered more territory, the indigenous course of development was arrested. An alien system of governance, justified by European theories and concepts, was imposed on this land.

The theory underlying British colonial rule is summed up by the concept of "white man's burden" – according to which the monarch of England was divinely mandated to rule over this sub-continent and civilize the backward natives. There is no concept of duty of the monarch towards her subjects in this colony. God had given her the right to rule over India with no reciprocal duties whatsoever!

The Queen of England issued a Charter to the East India Company to carry out its trading and colonizing activities, which clearly specified that all such activities must be beneficial to the Queen. That was the yardstick of good governance under colonial rule, that it must benefit the colonial power.

The institutions that were established for carrying out the British colonial mission in India were suited to the stated objective of maximum plunder to enrich those in power in London. The Lords and Generals who were sent to take charge of Indian affairs had the right to pocket some booty provided they first enriched the Board of Directors of the East India Company and later the moneybags of imperial Britain. Thus, there was a quid pro quo within the ruling elite, while there was none between the rulers and the ruled.

British rule violated Indian sensibilities in every possible way. People rose up in rebellion all over the sub-continent, right from the period of Company rule, to put an end to the *adharma* of a power that recognized no duty towards the people who produced all the wealth. Sever-



al kings and princes took the side of the *kisans* who tilled the land, and refused to pay tax to an illegitimate ruler who failed to fulfill his obligations to the ruled.

The Indian resistance to the illegitimate and alien authority gathered steam and exploded in the form of the *Ghadar* of 1857. Following brutal suppression of that massive revolt, the British colonial rulers systematically destroyed institutions and even symbols of Indian philosophy, economic and political theories. They concocted the lie that Indians only had spiritualism, no theories or knowledge that were worth anything.

The most powerful authority of the colonial state in a rural administrative district was the District Collector, also called the District Magistrate, with supreme power to administer justice and to enforce the executive orders of the government. He was executor and judge rolled into one – virtually the ‘lord and master’ in the district. Colonial rule gave rise to an entirely new concept of authority, hitherto unknown in this sub-continent. Each level of authority had duties towards a superior authority but none towards the people; while the people had duties and no rights. The supreme authority located in London, on the other hand, enjoyed unlimited rights and had no duties; the Crown was accountable only to God in theory, to the richest class in practice.

### **Mimicry in post-colonial India**

The founding fathers of independent India, in their wisdom, chose to retain the basic structure of state institutions inherited from British colonial rule, including the communally structured Army, public administration manned by career bureaucrats and headed by an elite Indian Civil

Service (or ICS), and the District Collector (or District Magistrate) acting as Lord and Master in each rural district. The scope of elected legislative bodies was extended beyond the Provincial Legislatures to include a central Parliament, modeled after the British Parliament. The arbitrariness of power was sought to be legitimized by a legislative body that was at arms length from the executive machinery. This separation of executive and legislative powers was alien to Indians, who had several thousand years of experience of statecraft which was not based on such a separation.

The mission of the colonial State was not to provide services to the public. It had the mandate to put down disturbances and maintain ‘order’, which meant enforcing compliance of the public with a system of plunder to enrich a minority of wealthy foreigners and their collaborators among Indians.

Post-independence, the mission statement was changed, but not the institutions and incentives required for realizing such a change. The Constitution of India borrowed freely from the constitutions of advanced countries in the world at that time,

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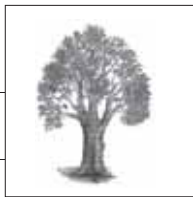
including from the socialist Soviet Union, to formulate a beautifully worded vision called Directive Principles of State Policy. One who reads it would think that India must really be a humane paradise. However, the District Collector remains Lord and Master of rural districts in independent India, whose performance is measured by whether he served the rulers in New Delhi and in the state capitals, not on whether essential public services are being delivered to the people of the district.

### **Conclusion**

Over 3000 years of experience with a well developed philosophy, along with economic and political theories based on that philosophy, has left a deep imprint on the minds of people in this sub-continent. A couple of hundred years of colonial statecraft, followed by six decades of mimicry, have not wiped out the imprint of thousands of years prior to colonial conquest. That is the reason why the ‘governance reforms’ designed by western educated brains will not and cannot end the yawning governance deficit in India. The mimicry can be ended, word and deed can be harmonized, if and only if a new, modern Indian basis is laid for governing this country. Such a modern theory of governance, fit for India in the 21st century, can only emerge if we Indians stand on the shoulders of the wisdom of our wise ancestors and not if we ignore their contributions and remain enslaved to the Eurocentric rendering of science, including political science and the theory of governance.

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*S. Udayan is an economist who writes on questions of political economy in a language that ordinary people can understand*



# “Indian mathematics is practical whereas the European is metaphysical”

*C K Raju has been arguing passionately through several lectures and books about the uniqueness of ancient Indian mathematics and how it influenced the rest of the world. He says what is taught as standard modern mathematics today, is based on theological positions taken by the Church after the Crusades. Shivanand Kanavi conversed with Raju on the results of his research in the history and philosophy of mathematics.*

(Excerpts below. The full conversation is available on the website [www.ghadar.in](http://www.ghadar.in) )

**S**hivanand Kanavi: Dr Raju, welcome to *peepul ke neeche*. Having looked at some of your writings, I see that you have researched deeply into the mathematical tradition of India as well as that of Persia, Arabia and Europe. Could you give us an overview of exchanges between India and West Asia in the field of mathematics?

**C.K.Raju:** As I have stated in the book (*Is Science Western in Origin?*—By C K Raju), the process of exchange with Arabs started with Barmakids (barmak from pramukh, Persian-Buddhists who were wazirs to Abbasid Khalifas—Ed). This was around the 8th century CE, after the conquest of Persia by the Arabs. Besides the spread of Islam in Persia, Persian customs spread to the Arabs. There was a tradition in Persia of importing knowledge from all over the world. It was based on a philosophy which regarded knowledge itself as virtue, like the Socratic philosophy. To make people virtuous you

gather knowledge from all corners of the world. It was begun by Khusrrow Noshirvan in the 6th century. At that time Justinian closed all the schools of philosophy in the Roman empire and many philosophers took refuge in the court of Noshirvan. According to the *Shahnama* of Firdausi, his wazir came to India and took chess, *Panchatantra*, etc. back to Persia.

There was also an astronomical tradition in Jundishapur (Gundeshapur) in Persia. This astronomy also traveled from India. Which is interesting, because Khusrrow's court already had the most knowledgeable people in the Roman empire, and if the *Almagest* or any other advanced astronomical text existed at that time then it would have been similarly collected and translated, but we do not hear about it. On the contrary, the *Almagest* itself starts off by addressing an unknown “Cyrus”. So it was probably constructed in Persia. Certainly, Greek knowledge

was translated into Persian and later into Arabic. But, so far as astronomy is concerned we know that the very fact that first it went from India to Persia and then Baghdad shows that Greek knowledge at that point did not compare in any way with the present-day versions of Ptolemy's *Almagest*.

There was also a strong tradition of neo-Platonism which came through texts in the Greek language, which probably originated in Egypt. This was called the “theology of Aristotle”, and that was the primary extent of “Greek” knowledge at that time. There was no Greek knowledge available from Byzantium at that time since all the schools of philosophy there had been closed by Justinian.

We also know that Arabic knowledge travelled in the other direction, to Greek texts. The proof is that *Panchatantra* is translated from Sanskrit to *Pahlavi* (and you find its reference in Firdausi's *Shahnama*)

and from *Pahlavi* it was translated into Arabic and then from Arabic to Greek. Among the Arabs it became the basis of a movement –Ikhwan as- *Safa* (the Brethren of Purity); so we know the route that knowledge took from India to Greek texts.

It also traveled directly, as in Ashoka's time, when Indian texts and medicinal plants went to Alexandria. The process really took off with *Bayt al hikma* (The House of Wisdom of Baghdad) which was linked to Islamic rational theology that valued knowledge as a virtue. It was closely related to *aql-i-kalaam*, which taught that Allah has given you aql and one must apply that aql in order to interpret the Koran.

**SK: Was there any exchange between Persia and Greece and Persia and India during Alexander's (Sikander) travel through Persia up to India?**

**Raju:** There is an account in the Zoroastrian book of Nativity that Alexander got his books from the Persian emperor and got them translated. The question is: what happened to them? Presumably, some of them, the looted books, went to Aristotle, Alexander's teacher, and some of them went to the corpus of the library of Alexandria. Aristotle was supposed to be the first person in Greece to have a library, so where did his books come from?

**SK: That does not sound very different from Elgin's marbles!**

**Raju:** (Laughs) Yes. People have not talked about the sources of books for the library of Alexandria. It could not have been those small city states in Greece, which did not have the capacity to produce them. If you look at the trial of Socrates, there were supposed to be 600-odd jurors. If you take ten persons in the population for every citizen then there would

**So far as astronomy is concerned, it went from India to Persia and then Baghdad. Greek knowledge at that point did not compare in any way with the present-day versions of Ptolemy's Almagest.**

still be only about 5-6000 people in Athens so how could they produce books on the scale of the library of Alexandria—half a million books as is normally mentioned? Only a Persia or an Egypt could have done that. In the case of Alexander, as with other military conquerors, knowledge flowed towards them in the case of barbarian incursions.

**SK: Arabs have been depicted as carriers and safe keepers of knowledge rather than creators of knowledge. Can you comment on that.**

**Raju:** There is an enormous amount of evidence to the contrary. My book mentions the case of Copernicus, where the Arabs were clearly the creators and the Europeans merely the carriers of knowledge. So it is good to look at the question: how did this story start, that Arabs were mere safe keepers of Greek knowledge.

**SK: In fact they have been depicted as barbaric nomads killing each other, who did not have any culture till the British formed various nation states in Arabia in the 20th century. Thus there were Pharaohs and then there were Bedouins till the Anglo-Saxons came...**

**Raju:** If you look at Arab literature (pre-Islamic) there is a depiction of a freewheeling society living in the desert. Post Islam, they conquered Persia and absorbed a lot of the administrative structure of the Persians and then there was this culture of books and libraries. It is undeniable that Arabs were creative and made contributions. So one should investigate about when the story started that Arabs were only safe keepers.

It started during the Crusades. They [the Christians of Europe] were fighting a religious war and Europe had a tradition of book burning. In fact, there were many fiats [by Christian emperors] right from 4th century to burn books. The library of Alexandria was burnt down. There was a tradition of burning heretical books which included secular knowledge. Within Christendom, there was not much of a culture of books and when they were fighting the Arabs they realized that they needed secular knowledge which was available in books. They captured Toledo which had a massive library [coming from] the *Umayyad khilafat*.

It took a lot of time [for the church] to arrive at the decision to translate those books [and not burn them]. This needed a justification. That was concocted by saying that this knowledge belonged to Greece and the Greeks were theologically 'correct'. This was regarding the early Greeks, mind you, since they were pre-Christian, whereas they [the church] had conflicts with later Greeks like Proclus, Theon, etc. The advantage of inventing a person like Euclid was that you can attribute a philosophy to that individual which suits you.

**SK: One of the important theses put forward by you is that**

**mathematics has cultural foundations. Can you say that there is an Indian way of doing mathematics and if so, what are its features?**

**Raju:** There are some clear cut features. In India there was just one notion of proof or *pramana* which was applied everywhere: be it philosophy, mathematics or physics. The first *pramana* was *pratyaksh* (direct demonstration). Empirical means were accepted as proof. This you find in *Sulbasutras*, in Aryabhata, and right down to Yuktibhasa.

For example the so called 'Pythagorean theorem' could be proved by drawing the triangle on a palm leaf, and it could be shown that the square on the 'diagonal' was equal to the sum of the squares on the other two sides. This could be shown by cutting, rotating etc. Whereas the European tradition would disagree and say that mathematics is purely metaphysical and by bringing in motion you are bringing in physics and it violates the basic idea of geometry as concerned with immovable space. That is one major source of tension.

Secondly, today the notion of proof is seen in a very rigid manner in a completely metaphysical way. How do you carry out deduction, on what logical basis? After all there are different systems of logic which are prevalent. There is the Jain system of *syadvad* and *saptabhangi*, there is Buddhist logic of *chatuskoti* and so on. In fact, in the debates between *Naiyayikas* and Buddhists over a thousand year period you find that they are not addressing each other's issues because of differing concepts of *anumaan* [inference or deduction].

Europeans declare their logic as universal, when it is not.

**It took a lot of time for the church to arrive at the decision to translate Arab books and not burn them. This needed a justification. It was concocted by saying that this knowledge belonged to Greece and the Greeks were theologically 'correct'.**

There is a third aspect which I have called zeroism, which has to do with what is mathematics good for. In the neo-Platonic view it is good for the soul. The European view is that mathematics is good for providing proof. But in India, the aim of mathematics was not to provide *pramana* but to do something *vyavaharik*, something practical. If I am doing something *vyavaharik*, I don't mind making approximations. If I am computing, then the computer is going to make so many approximations. Many things are discarded or zeroed, and that is acceptable as floating point arithmetic.

European mathematics demands perfection, where you cannot discard the smallest entity. The belief in perfection comes from a religious view of mathematics. It then gets into theology that God made the world and he wrote the laws in the language of mathematics, which must hence be perfect. In India mathematics is *ganit*, which is counting and calculations.

**SK: Modern mathematicians claim that mathematics is universal and not Indian or European. Would you comment on that?**

**Raju:** Universality is factually incorrect. The way mathematics was done in India was different from Europe. So the Indian place value system and algorithms or calculus took such a long time to be absorbed by the Europeans. Metaphysics is never universal. The moment mathematical proof becomes metaphysical it ceases to be universal. In fact it can become 'universal' only to the extent that it is demonstrable empirically (*pratyaksh*). Universality is just a European prejudice as they are ill informed about other cultures, so they declare universality from a parochial point of view.

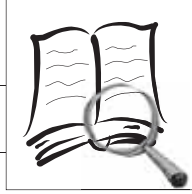
**SK: The crude way in which universality is put forward is by saying that  $2+2=4$ , no matter where you are; in Greece or Arabia, India or China...**

**Raju:** It is not true, and I have argued it at great length in my paper presented in Hawaii. Let us say we are using a computer to add. Since  $2+2$  is a complicated case, let us take  $1+1$ . The answer could be 1 or even 0 depending on what kind of logic gate one is using. So, I have to specify and say I am using integers. But what are integers? If I do arithmetic with integers on computers say using a C program on a 16 bit machine it will not give 2 as the answer but something else, unless I do rounding off. In order to specify what are integers I need infinite time and infinite memory.

In a commercial transaction we get into an agreement saying Rs 2 plus Rs 2 would be Rs 4. But that

*Contd... on inside back cover*





## Books

# Tipu Sultan's dreams

*Shivanand Kanavi appreciates a play by Girish Karnad,*

'Tippuvina Kanasugalu' (Kannada), Manohar Grantha Mala, Dharwad

Also in English Translation: Two Plays by Girish Karnad - The Dreams of Tipu Sultan/Bali: The Sacrifice,  
Oxford India Paperbacks, Oxford University Press, 2005

The great warrior king Tipu Sultan, known as the Tiger of Mysore, stood valiantly in the way of wily British colonialism in India. His statecraft was forward looking and was marked not only by burning patriotism but also by administrative efficiency, agricultural development, manufacturing, international and inter kingdom diplomacy, sericulture, gold mining and refining, pearl culture, toy making, foreign trade, rocketry and development of military technology and manufacturing. However the well known playwright Girish Karnad brings to our notice a little known fact that Tipu was also literally a dreamer. He actually kept a journal where he noted down his nocturnal dreams. Karnad weaves his play around this fact.

It would be great fun to watch a production of the play in appropriate historical surroundings like Delhi's *Purana Kila*, but even a reading of the play leads to admiration for the heroic-tragic personality of Tipu as well as the craftsmanship of the playwright.

It is not easy writing historical fiction. There will always be critics looking for historical accuracy. However, if one wanted factual history, one should read a history tome and not fiction. On the other hand there are those who use their characters, historical or otherwise, to mouth the author's own lemmas and dilemmas.

The characters just become cardboard messengers of the author's 'message' and never come alive. If one were to engage in a serious polemic or put forward a thesis then one could write an essay and not dabble in fiction. However we see a large number of authors succumbing to these two extremes. It is only truly good writers who raise their fiction above essays or polemical propaganda. This play proves that Karnad belongs to that select few.

True to the panoramic canvas of nearly twenty years of Tipu's confrontation with British colonialism, involving three Anglo-Mysore wars, Karnad creates a cornucopia of interesting characters: the serendipitous historian Kirmani; Col Colin McKenzie who is studying *Arthashastra* and pushing for a definitive history of Tipu Sultan, typifying Orientalist scholarship when he says "we want to understand our enemy"; the upstart Arthur Wellesley pushed into the limelight by his brother, though he went on later to become famous as the Duke of Wellington after the battle of Waterloo; Richard Wellesley or Lord Mornington, the Governor General, scheming against Cornwallis and pushing his brother Arthur forward with a 'plum' position; the ambitious Cornwallis waiting to avenge his humiliation in America; the politically naive Maratha, Haripant, and



Tipu Sultan

(picture source - [www.google.com](http://www.google.com))

of course the warrior-dreamer Tipu and his children.

Karnad raises several questions: regarding the clichéd British colonial statecraft of chicanery and divide and rule; the short-sightedness of Maratha tactics; Tipu's lack of killer instinct and so on, but never imposes his own conclusions. He leaves many tantalizing loose ends so that the reader or the viewer can draw his own. He weaves historical facts regarding Tipu's progressive statecraft effortlessly into the dialogue.

Many may not know that Karnad's major as an undergraduate was mathematics. Perhaps as a result one discerns a precision and leanness and balance in his prose. Overall it is an enjoyable play that packs so much in so few pages.





Sanskriti

## Restoring Lost Pride!

**Salvinder Dhillon**, continues reflecting on his experiences as an immigrant in the UK and his encounters with historical prejudices.

(See the last issue for the first part of these recollections)

Despite the pressure to be wary of communists I decided to attend the meeting organised by the Indian Progressive Study Group. The meeting called 'Colonialism and Imperialism the cause of famines in India' was held in London in 1970. For a person yearning to find the answers to poverty in my motherland it was an eye opener. Hardial Bains was the main speaker. He gave a detailed account of how India was colonized, the uprooting of traditional agriculture

and industry, the creation of collaborative propertied classes to establish agriculture and industry serving the colonial interests. He pointed out that India had faced only 50 famines from the 11th century to the 18th century compared to Europe suffering from 200 famines in the same period. However famines had become a common feature as a result of colonial destruction of the old village system. The myth that India was always a backward poor country began to erode as new facts began to

counter my indoctrination in history in my schooling in Britain.

The speech was followed by open discussions with opportunity to exchange opinions and ask questions. Skepticism at this new perspective of history began to give way to acceptance as the facts began to replace previous teachings.

Gradually a sense of lost pride began to emerge in my mind. It was like taking a fresh breath of air. I began to feel that being an Indian was not necessarily something to be ashamed of. My motherland had a proud tradition and history. This new learning stood in contrast to what I had been taught in the British school system. In place of an inferiority complex a sense of pride grew. Previously, racist remarks that we were from a country of beggars and should 'go back' would be very hurtful; now I felt I could hold my head high and counter racist taunting with pride and dignity.

This new beginning aroused a passion for knowledge in understanding real history and the proud struggles for freedom from oppression of my own people as well as those from other countries. I began to attend more meetings and study literature from progressive organizations.

This new found pride served me well in dealing with situations of racial abuse and countering the Eu-



Picture source - [www.google.com](http://www.google.com)

rocentric teaching of history to our generation abroad. It was during my postgraduate studies, in the summer vacation of 1974, that I realized how people of other colonised countries could make racist remarks without understanding their own history. I was working at an electronics company in a small town near Southampton. I was the only non-white person working there. I stood in a queue in the canteen during the lunch break, when suddenly a lady behind me made racist remarks.

“Why don’t you go back to your country, you black wog”, along with other abusive comments. I was shocked and horrified but remained composed. Normally I would have replied angrily and put a stop to racist abuse straightaway. On this occasion I realized from the accent that the lady was of Irish origin and decided to remain calm. I replied with dignity and confidence.

“Madam, I sense an Irish accent, I would like you to join me for coffee and I will be happy to share my reasons for being here and you will find we have a lot more in common than you may think.”

She grunted a bit but allowed me to sit on her table and start a conversation.

I started by making comparisons of Irish colonial history and Indian colonial history.

It took a number of lunch breaks to complete the comparisons. Reluctantly she gave me the time to exchange information and views and often expressed skepticism

Gradually she began to accept the view that we had a common history and her racist opinions were largely due to not being aware of history in the manner we had discussed. She had been led to believe that she was British and I was an immigrant

threatening her livelihood.

I went on to add that we were both working for a living and our lack of unity helps the owners of companies. By fighting with each other, we cannot succeed in efforts to improve our work conditions and ensure security of livelihood.



Picture source - [www.google.com](http://www.google.com)

A person who was initially hostile gradually became a friend. Like me earlier, she was a victim of a Eurocentric perspective of history. I also discussed the patriotic Irish struggles for freedom from colonial rule. I began to sense that her pride began to grow.

The importance of knowing one's own history from a factual perspective cannot be underestimated. Three years ago I was given an opportunity to take a history class in a school in Acton, London. More than half of the pupils were of South Asian origin. The subject was the history of Clive of India. I quickly browsed through the chapter in the history text book. I was angered to find that the murderer and tyrant Robert Clive was portrayed as a capable administrator and a hero. I instructed the students to close their book for 20 minutes and gave my account of the history of Robert Clive and the role he played in the conquest and colonisation of India. I then asked the students to read the text book version of history and draw their own conclusions. Most of

the students portrayed Robert Clive as a butcher and tyrant. They wrote their conclusions in their note books.

The following week the history teacher called me up to complain that I had deviated from the text book. I was a lecturer in IT and not a history teacher. I replied that even being a lecturer in IT, I knew more factual history than he did. I asked him to elaborate what was incorrect in my account. He could not provide convincing arguments. I finished by saying that I was fortunate I knew my history from my own findings. What of the poor pupils being taught false accounts of history from school text books without questioning the validity of the facts being taught?

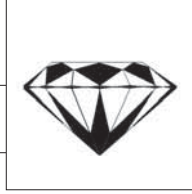
These children are our future, what kind of future are we creating?

It is our duty to seek the facts and I am proud of what I did.

I asked the history teacher to do likewise.

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*Salvinder Dhillon is a UK based teacher and a rights activist*



Jewels of India

# Sarvajnya: A radical encyclopedic

*Shivanand Kanavi draws a portrait of Sarvajnya, the radical poet who strode through Karnataka of the 16th century, about whose personal life little is known.*

A group of writers led by Diderot, d'Alembert, Rousseau and Voltaire, created the Encyclopedia in 18th century France and thus came to be known as Encyclopedists. They were all fired with a common purpose: to further knowledge and, by so doing, strike a resounding blow against reactionary forces in the church and state. The underlying philosophy was rationalism and a qualified faith in the progress of the human mind. Their work proved to be far more revolutionary and radical than their contemporaries had envisioned and had an indelible impact on the French Revolution.

Roughly two hundred years prior to the French Enlightenment, strode a poet all over Karnataka who also called himself an encyclopedic—a *Sarvajnya*. Normally in the Indian tradition there is great humility and display of one's learning is frowned upon. The word *Sarvajnya* is more often used to ridicule those ignoramuses who act as 'know-alls'. But *Sarvajnya* was unabashed and truly used his poetic skills to comment on all sorts of subjects from the daily life of people. His poems talk about agriculture and different professions; about the joys and problems of family life; about the caste system; about hollow religious rituals; about all the four goals in life, *dharma*, *artha*, *kama* and *moksha* and so on with a great sweep and with profound wisdom.

His tools were biting satire as well as gentle humour. At the same time these aphoristic pearls of wisdom became so popular that one could find manuscripts recording them in ordinary villagers' homes as well as in royal palaces. In fact over a period of time, they have become substitutes for proverbs. Rev Chenappa Uttangi (1881-1962) did a yeoman service by traveling all over Karnataka for nearly a quarter century from village to village to collect and edit over 2000 of *Sarvajnya's* *vachanas* or poems, and published them in 1924. *Sarvajnya* is spoken of with the same affection and respect by the ordinary folk and the learned alike as *Vemana* in Telugu and *Tiruvalluvar* in Tamil.

*Sarvajnya's* poems are marked by high poetic qualities as well. Besides using analogies, allegories, alliteration, puns and double entendres, they use simple pure Kannada words. *Sarvajnya* not only used the folk idiom and language but also a common folk metre called the tripadi—three liner — and raised it to great heights. His amazing control over the form of tripadi has led to literary critics comparing him to the mythological *Bali* who is supposed to have used three foot steps to cover heaven earth and hell.

His influence over later poets is deep and extends up to the present day. He was greatly admired by D R Bendre (1896-1981), who himself

was one of the great poets of the 20th century. Bendre said of *Sarvajnya*, "His poems are like an instruction manual to all writers. They are marked by: the most appropriate choice of words; correct analogies and metaphors; the truth of his examples and allegories; breadth of experience; and nuanced sensitivity of observations. The morals in his *vachanas* are not dry preachings; they are filled with the sensuality of *subhashita* amalgamated with subtle humour"

However other than what we learn of his rational world outlook and honest expression, we know very little of this towering itinerant iconoclast, who strode through Karnataka nearly 500 years ago. Some autobiographical poems imply that he was born in Masoor near Dharwad. Dating him is also difficult and is based on the fact that a work written in 1600 CE refers to *Sarvajnya*. As for the faith or caste he was born into, again there have been guesses but no confirmation. His *vachanas* indicate clearly that he chose *Veerashaivism*. But it would be a sign of extreme narrow mindedness to put this radical in a straight jacket of faith and caste.

A few of his *vachanas* have been translated below by the author. As is usual in such cases, translation can only give a sense of their content but not the literary and cultural richness.



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## Jewels of India

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The Yogi has no caste, the wise one is not stubborn  
The sky has no pillar to hold it up, the heaven  
Does not have a ghetto for the outcaste, says *Sarvajnya*

The world is born out of the unclean  
The Brahmin however says “don’t touch me I am clean”  
Then where was he born, asks *Sarvajnya*

Bones, entrails, nerves, skin, holes, cavities  
And flesh with all kinds of excretion, constitute all beings  
Where then is the justification for caste asks *Sarvajnya*

We walk on the same earth and drink the same water  
We are all burnt by the same fire, then where does  
Caste and gotra come from asks *Sarvajnya*

They bring drinking water from the same source and cook  
But do not want to sit together and eat  
*Sarvajnya* does not need such people

The fingers count, the tongue multiplies  
But if the mind is distracted  
Then it is like a street dog says *Sarvajnya*

Ganga, Godavari, Tungabhadra and Krishna  
You dipped in all of them, but you did not realize the God  
within you asks *Sarvajnya*

If dipping in holy water the Brahmin jumps straight to  
the heaven, then why won’t a frog in the same water  
Jump up too asks *Sarvajnya*

If Sandal wood on the forehead takes you straight to  
heaven then why not the stone  
On which you make its paste, asks *Sarvajnya*

If three holy threads take you to heaven  
Then why not someone wearing  
An entire rug asks *Sarvajnya*

If a thick coat of ashes takes you to the heavens  
Then why not a poor  
Donkey wallowing in it, asks *Sarvajnya*

In a crore of professions agriculture is the highest,  
Agriculture leads to textiles too  
Else the country itself would be in trouble

If you tell the truth as you see it they get upset  
That is why it is very difficult to see people who speak  
the truth as they see it, on this earth, says *Sarvajnya*

And lastly,

One does not become a *Sarvajnya* through arrogance  
By humbly learning a word from everyone  
*Sarvajnya* became a mountain of knowledge



*Sarvajnya* (Picture source - [www.google.com](http://www.google.com))

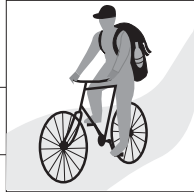
These are but a few samples. It is difficult to choose from a treasure house of over 2000 of *Sarvajnya*’s poems where he covers a vast number of topics in everyday life.

It is appropriate that recently the governments of Karnataka and Tamil Nadu commemorated *Tiruvalluvar* and *Sarvajnya* through unveiling their statues in each other’s states. However, a more concerted effort should be made to introduce Indians to the rich diversity of cultures and literature from different regions and languages of India.

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Reference: *Sarvajnya Vachana Sangraha Selected Vachanas of Sarvajna, Compiled by M.Mariyappa Bhat, Sahitya Akademi, New Delhi, 1996*

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## Travelogue

# India and the Goose Pagoda

*S Raghavan transports us to the ancient city of Xi'an in China and a few centuries back in time, when relations between India and China were marked by mutual respect and a great give and take in technology and philosophy*

I disembarked from the two-hour flight from Shanghai to Xi'an with a lot of expectation. Xi'an is present capital of Shaanxi province of China. But centuries back it had a much higher stature. It is one of the oldest cities in Chinese history. Xi'an is one of the Four Great Ancient Capitals of China and that too the capital of some of the most illustrious dynasties in Chinese history such as the Zhou, Qin, Han, Sui and Tang dynasties.

Xi'an is a tourist paradise. Even an energetic tourist needs at least two weeks to visit all the locations that are considered a must for any decent tourist and I had only three days to discover this paradise. So, I decided to concentrate on the ancient part of the city rather than the modern. I had heard that the city had more than 3100 years of history. The first place in the itinerary of a history enthusiast is the Terracotta Army inside the Qin Shi Huang Mausoleum, belonging to the 3rd century BCE. The tourist guide who spoke fairly comprehensible English made sure we understood that we were gazing at the eighth wonder in the world, nothing less.

Our next stop was the Bell Tower and the Drum Tower which get thousands of visitors every day. Another place of historical interest was the city wall and a moat around it, constructed in 1370 during the Ming Dynasty, which remain intact

till date. With just a few evenings to spare, I had to pull myself away from the Chinese Valentine's day celebrations that were keeping revelers and tourists engaged and entertained with a lot of kite flying. Instead I focused more on the historical relations the city had with India.

And in this aspect my visit to Xi'an was a real revelation. The close connections that India and China had in the past have always been a topic of curiosity for me. Relations between China and India have improved tremendously over the past few years—so much so that China is the largest trading partner of India today. But one doesn't come across many Indians on Chinese roads and tourist spots as one would in London or the Niagara Falls. Indications are that this

will soon change as ties improve between the two great countries with a glorious past. Nevertheless, the fact is that many centuries back the Silk Road must have been the most beaten track for traders and intellectuals alike in the world.

What fascinated me most was the majestic spire of the Great Goose Pagoda. The Pagoda was built under the supervision of Xuanzang (known to us as Huen Tsang), who returned to China in 645 CE after 16 years of travel across India and central Asia (see <http://en.wikipedia.org/wiki/Xuanzang> for more information). At that time Xi'an was the eastern terminus of the Silk Road through India. The Shaanxi Provincial History Museum and Famen temple have enough evidence of this flourishing trade along the Silk Route.



Giant Wild Goose Pagoda, Xi'an, China (picture source-author)



In the seventh century Yi Jing, who visited India after Xuanzang, asked, "Is there anyone in any part of India who does not admire China?" This may be a bit of exaggerated rhetoric then but not today. And the feeling of admiration is mutual I would say. In my one week trip to China I could easily sense a feeling of growing admiration for the achievements of the Indian people everywhere.

Yi Jing spent 10 years at the institute of higher learning, Nalanda. He studied medicine, in particular Ayurveda, in addition to Buddhist philosophy and practice. He was one of the many Chinese scholars who visited India in the first millennium. In the other direction hundreds of Indian scholars went to China and worked there between the first and eleventh centuries. They were engaged in not only translating Sanskrit documents into Chinese but also in mathematics and science. Several Indian mathematicians and astronomers held high positions in China's scientific institutions. The high point of this exchange must have been when an Indian scientist called Gautama Siddhartha became the president of the official Board of Astronomy in China in the eighth century.

Besides Yi Jing I would like to mention two other illustrious visitors from China just to give more depth to the close relations that the two countries had at that time. The first Chinese scholar to make a serious attempt to document Indian life was Faxian (known to us as Fahien), a Buddhist scholar from western China. He visited India between 399 CE and 412 CE in India. He came via Khotan and after 10 long years in India returned by sea, from Hooghly via Sri Lanka and Java.

The most famous visitor from



A view of modern Xi'an

China, however, was Xuanzang, the supervisor of the Great Goose Pagoda. He arrived in India in the seventh century when the Tang Dynasty was ruling China. He was a formidable scholar. He collected a lot of Sanskrit texts for translation. He traveled throughout India for 16 years, including his collegiate years in Nalanda. There he studied medicine, philosophy, logic, mathematics, astronomy and grammar, and of course Buddhism. He is believed to have met Emperor Harsha and discussed Sino-Indian relations. One of the pagoda's many functions was to hold sutras and figurines of the Buddha that were brought to China from India by Xuanzang.

The Big Wild Goose Pagoda is located within the Da Ci'en Temple. As I entered the temple I could see the two big landmarks of Xi'an – the Bell Tower in the east and the Drum Tower in the west. What I had not bargained for was the Hall of Mahavira, right along the central axis of the Temple, and very near the

Pagoda itself! The carved statues of the Sakyamuni, the 18 arhats, who were spiritual practitioners in the sramanic tradition of Buddhism and Jainism, as well as Xuanzang himself were imposing.

The constant stream of traders and intellectuals on the Silk Route many centuries back signaled the material and spiritual domination of the two great countries in the world of the first millennium. These links are hardly remembered today. They get noticed only through religious symbols such as the Great Goose Pagoda, though the relations spanned the entire knowledge spectrum. There is definitely a need for a broader understanding of the reach of Sino-Indian relations in the past so that it serves as a firm foundation for the growing relevance of contemporary Sino-Indian relations.

I hope in my next visit to China I get more time to further unravel the mysteries of the Silk Route for myself.



## Perspectives

# Traditional Knowledge Systems: Genesis & Current Relevance

*Traditional Knowledge Systems are the mother of all sciences and innovation as the primitive people had close ties with their environment, which was not something out there but part of their being. Despite the tremendous importance and value of traditional knowledge, especially in the hilly areas such as Uttarakhand, it is at a risk of becoming extinct for various reasons, warns D P Agrawal*

In her path breaking book, Laura Nader (1996) made a powerful plea that traditional knowledge systems (TKS) were scientific systems in their own right. She condemned the western attitude of creating hegemonic categories. She said that Western thought imposes the contrasting categories of science/religion, rational/magical, developed/under-developed and so on. But these categories are contrived and arbitrary. An aboriginal leader, Kwagley (in Nader 1996) complains, "Down through the millennia, the Yupiaq produced and maintained a science and technology to support a sustainable social and economic system ... (but) at the advent of Western society the Yupiaq ways were pronounced primitive and savage".

Similarly Pat Howard comments, "regarding ecosystems and related logics of subsistence, traditional methods of healing and prophylaxis, traditional methods of socialization and education, methods for adjudicating disputes and the convictions and experience that inform them, traditional systems of self-govern-

ment and communal decision making, and a myriad of languages and written and oral traditions – are not even recognized as knowledge. They are viewed as superstitious beliefs and irrational behaviour". (Canadian Journal of Communication, Vol. 19, No 2 (1994)).

Knowledge and science originate in an ambience where humans are in close contact with their environment. During the course of several millennia humans, through trial and error, learnt empirical science and transmitted it to their progeny through the word of mouth, and quite often through the heuristic devices of legends and myths. Thus the origin of knowledge and science lies with the primitive societies.

In countries like USA, Australia and New Zealand, the European colonisers decimated the aboriginal populations and thus totally cut off their links with the local cultural traditions. But in a country like India, with deep antiquity, both the systems have been flourishing and complementing each other: the Greater Tradition (Margi) and the Lesser Tradition (*Desi*).

### Examples from Uttarakhand

The folk science of Uttarakhand is very rich in its diversity: architecture, hydraulics, ethnomedicine, ethnobotany, metallurgy, agriculture, etc. The micro-variations of the ambient harsh environment have been responsible for the extremely rich community knowledge systems and a biodiversity, necessary for sustainability of human life here. Despite the tremendous importance and value of traditional knowledge, especially in the hilly areas such as Uttarakhand, it is at a risk of becoming extinct for various reasons.

In secular architecture, there are examples of houses made of timber and stone which have resisted the ravages of time and earthquakes for the last 1000 years (Das 2007; Rautela and Joshi 2008). Such architecture has direct relevance for designing modern houses in highly seismic zones.

The traditional hydraulics of Uttarakhand was also quite developed and sophisticated. They built naulas (perennial wells), water mills and a variety of irrigation chan-

nels. The whole process of making a Naula reflects an ancient empirical knowledge based on trial and error and close observations. Even to identify the site to dig they go by the occurrence of five typical plants including Brahmi. In the masonry no mortar is used so that water can ooze through easily. To ensure a perennial supply of water, they test with a special type of clay (kamet) which absorbs and sucks out water. In earlier times they used to put copper sheets/pots to purify water. Such Naulas provided pure drinking water for villages and towns.

When the capital of the Chand Kings was shifted from Champawat to Almora in the 16th century, the king commissioned the digging of 300 odd Naulas; only a few of them survive today. To keep them clean they were treated as temples and any pollution was strictly taboo. They knew the importance of infiltration wells and used shallow depressions (chals/khals) to collect rain water for recharging such aquifers (Shah in press).

Through several millennia of close observation, the local inhabitants of Uttarakhand developed a rich medicinal system based on almost 2000 herbs, animal parts and minerals. This was a totally oral knowledge system. Even today when allopathic hospitals are so rare in the interior, the local people depend upon the traditional Himalayan medicine. The interesting thing is that almost 700 plants of this indigenous system have been incorporated in the *Materia Medica* of the Ayurveda system.

The Central Himalayas had an extensive pre-modern iron industry based on local ores. We have shown that high-grade goethite, magnetite, and pyrites are available there. The

**Through several millennia  
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sites with the affix agar (Sanskrit for mine) are invariably associated with copper and iron mines. It is said that till a few decades back rust-free iron vessels were being produced in Lohaghat area of Kumaun. Geological surveys have shown extensive evidence of iron minerals/workings in the region. Early carbon-14 dates (c. 1000 BCE from Uleni iron smelting site, near Dwarahat) and ancient iron smelting traditions suggest Kumaun to be the probable source of early iron for northern India.

**Myths and Legends**

Folklore deals with the past, yet it is a dynamic tradition where the bards of different generations keep interpolating into the original core of the story. In folklore, cause and effect are related in a peculiar folk manner and we can't judge them through modern logic. In the folk mind, supernatural is as real as the material reality. The folklore tradition is based on the word of mouth and memory which gives it a perpetual life and consistency. There is regional variation in folklore because of different bard families reciting and altering their folklore rendi-

tions. Thus, folklore is a collective tradition of the people.

In Uttarakhand, Central Himalayas, the concept of Nanda is unique in many ways. She is the consort of the Brahmanical god Siva; killer of Mahish, the demon; royal family deity of the Chand Kings of Kumaun. Nanda, in the folklore of Uttarakhand, is quite a prominent figure. She is depicted as a local village belle returning to her mait (mother's place) from her sauras (in-laws' house). The folklore says that she returns in the month of bhadon (roughly 15 August to 15 September) crossing rivers, ravines, slopes and steep ascents. On the way she rests under a chir (pine) tree and asks it how far her mait could be. The chir rudely replies, "Who the hell cares for your mait". This elicits a rebuke and a curse from Nanda, "You vain fellow, no plants will grow under you, no animals would eat your leaves, no birds will build nests on your branches and no bees will ever make their hives in them". Her next stop is under a banj (oak) tree. It welcomes her and asks her affectionately to treat its canopy as her own mait and feel at home. Nanda is pleased and blesses the oak, "You will always remain green, birds and bees will make their homes on your branches, water springs will always be near your shade".

The story is apocryphal but it clearly depicts the close relationship of the local people with nature and environment. Nanda's rebukes and blessings are in fact ecological descriptions of the properties of oak and chir pine. For these hill people, environment is not something out there but is interwoven with their lives, and is part of their being.

Myths and legends represent the

attempts of our ancestors to explain the scientific observations they made about the world around them and to transmit such knowledge to posterity. Modern humans often think that science is their monopoly. I would like to emphasise that scientific observations of the world around them were made by early humans too.

Below, I will compare some of the legends and modern scientific observations about geological events in the Indian subcontinent. We will discuss three examples.

### 1) Draining of Satisara in Kashmir

The geology of Kashmir (India) has been studied for more than 150 years now. As a result of these studies, and more recently our own (Agrawal 1992), it is now known that due to the rise of the *Pir Panjal* range around four million years ago, a vast lake formed, impounding the drainage from the Himalayas. Subsequently, the river Jhelum emerged as a result of the opening of a fault near Baramulla, draining out the lake about 85,000 years ago. This is accepted geological history of the valley (Agrawal 1992).

Now let us compare the legend. According to the earliest traditional accounts the lake called Satisara, the lake of Sati (Durga), occupied the place of Kashmir from the beginning of *Kalpa*. In the period of the seventh *Manu*, the demon *Jalodbhava* (water born), who resided in this lake, caused great distress to all the neighbouring countries by his devastation. The *Muni Kasyapa*, the father of all *Nagas*... thereupon promised to punish the evil-doer, and proceeded to the seat of Brahma to implore his and other gods' help for the purpose. His prayer was granted.... The demon who was invisible in his own element refused to

come out of the lake. *Vishnu* thereupon called upon his brother *Balabhadra* to drain the lake. This, the latter effected by piercing the mountains with his... ploughshare. When the lake became dry, *Jalodbhava* was attacked by *Vishnu*....

Ignoring the mythical fights between gods and demons, the legend does depict an account of the draining out of the primeval lake. Most of the earlier geologists, including Godwin-Austen and Drew, did take this legend seriously and inferred that early man did observe the geological changes in his area and transmitted the knowledge in the form of legends. Perhaps this was an accepted traditional mode of scientific communication where the facts were right, but the explanations were mythical.

### 2) Parasurama and the Sea

The sea level on the west coast of India, as elsewhere during the Ice Ages, was about 100 meters lower than today and started rising only after 16,000 BP or so. This is the accepted eustatic history. The related legend says that when *Parasurama* donated all his land to the *Brahmins*, the latter asked him as to how he could live in the land he had already donated away. *Parasurama* went to the cliff on the sea shore and threw his *Parasu* (hatchet) into the sea and the sea receded and then he occupied the land thus emerged, obviously a reference to the regressions of the sea and the newly emerged land.

### 3) Vashista and Sarasvati

The third example is of the river *Satluj*, a tributary of the Indus today, which was a feeder stream of the ancient *Sarasvati*, that flowed through modern Rajasthan. The

*Sarasvati* eventually dried up mainly because its two main feeders - the precursors of the *Satluj* and the *Yamuna* - were pirated by other rivers, as is evident from the study of Landsat images (Agrawal and Sood, 1986). In finding its new course, the *Sarasvati* braided into several channels. This is accepted geology.

The relevant legend says that the holy sage *Vashista* wanted to commit suicide by jumping into the *Sarasvati*, but the river would not allow such a sage to drown himself and broke up into hundreds of shallow channels, hence its ancient name *Satadru*. Unless early man observed the braiding process of the *Satluj*, he could not have invented such a legend. This is another instance of explaining a geological observation through the model of a legend.

## Conclusions

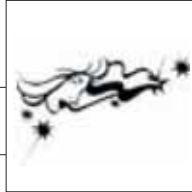
I have tried to show that Traditional Knowledge Systems is the mother of all sciences and innovation as the primitive people had close ties with their environment, which was not something out there but part of their being. To ensure their livelihood they had to observe closely the local flora, fauna, rocks and minerals. Thus, through trial and error and experience of millennia they developed an empirical science. They had a symbiotic relationship with nature and even today we could use Traditional Knowledge Systems as a valuable resource for sustainable development.

(Excerpted from a paper in print)

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*Dr. Dharma Pal Agrawal, a distinguished scientist, currently leads Lok Vigyan Kendra (Almora) carrying out research into the past as well as training a future generation of enquirers.*





## Short Story

# Justice

By S Raghavan

**M**aniammai had woken up before the streak of dawn lit up the lower part of the sky. Her husband and two children were still fast asleep. She gathered her clothes and hurried to the nearby river down the winding path from her house. Thick bushes of the snow white mullai and the red and orange *kanakambaram* covered the two sides of the narrow path. If it had been any other day she would not have hurried. She would have slowly wafted down the path inhaling the heady perfume of the *thazhampoo*, a fragrant pine flower, and gathering enough *mullai* and *kanakambaram* flowers to string together a strand for her dear daughter. Today she could not afford to do that. She had to get ready in a short time and leave for her first assignment as a member of the *Nyayattar*.

Under the reign of *Sundara Pandyan* in the twelfth century a system of popular courts and people's judicial committees was functioning. Innocence of persons was presumed by the courts, while guilt had to be proved. Popular and lesser courts dispensed justice in their own way. These courts included the village assemblies, merchant guilds, caste elders, meeting in the local temple or the village public hall, to decide the cases which came within their purview.

*Maniammai* was a member of one such judicial committee. She was a *Nyayattar* – a juror. Along with other jurors she was to give her verdict on two cases involving different villages.

The fact that these cases had come up to the popular court indicated that they were more than minor disputes concerning only a few individuals. In that case, *Maniammai* knew that they would have been settled at the village level itself in the local assembly, which had enormous powers in settling local disputes. The erring individual would be made to pay a fine or donate to a charitable endowment at a place called the *Darmaasana* (the seat of justice). Even crimes such as manslaughter or murder were punished by fines. She recalled a case where a man who had stabbed an army commander in a fracas was ordered to maintain a perpetual lamp at a temple. Capital punishment was generally used as a last resort. Crimes against the state such as treason were heard and decided by the king and his ministers.

When she reached the large *man-*

**Under the reign of *Sundara Pandyan* in the twelfth century a system of popular courts and people's judicial committees was functioning. Innocence of persons was presumed by the courts, while guilt had to be proved.**

*dapam* where the cases were to be heard, *Maniammai* was surprised to see the huge turnout. Obviously today's cases concerned a whole lot of people. "This means that I have to be very vigilant, the decision is not going to be so simple", she warned herself. Hundreds of villagers had turned up to witness what was expected to be a fiery session. The men wore white *dhotis* girdled around their groin and neatly tucked behind. All of them had *angavastrams*, and some of the older men had made a turban out of it to shield them from the hot sun during their walk from the village to the *mandapam*. In contrast to the rather drab attire of the men, the women had dressed themselves in a mind blowing array of colours, the older women turning out in *sarees* and the younger ones in skirts and *davani*. Most of the women wore gold or diamond rings, for these were a must on special occasions, even for village women. Most of them had long plaited hair decked with flowers. Others had stacked their hair into a conical *kondai*. Women belonging to one village were silently appraising their counterparts from other villages while the men were chewing scented betel leaf or engaged in quiet conversation. Clearly, today was an outing as well, besides the business of arriving at a reasonable settlement in the dispute.

People from the two warring villages, protagonists of the first case, stood glaring at each other while their headmen came out in front of



## Short Story

the *nyayattar* and presented their case. It appeared that the two villages, *Navalur* and *Kulattur*, had a common irrigation channel that served both of them and which flowed from *Navalur* to *Kulattur*.

The headman of *Kulattur*, *Nadalvan*, started his defence in an austere tone. "Learned judges", he said. "This year, as you are aware, the monsoon failed us miserably. But should we not have shared whatever water that came down from the skies? The *Navalur* people gave us puny amounts of water just to quench our thirst. The rest -- they used it all up for growing paddy in their area. Our crop has been completely ruined". He eloquently described the plight of his people since then. Quite satisfied with his presentation he went back to his seat.

The *Navalur* headman, *Vamanabhata*, admitted in a very forthright manner that this is exactly what happened. "How could we share the water with them", he pleaded. "With the amount of rains that we received,

it would have been suicidal to cultivate in both the villages. So, we decided that the wisest thing to do was to cultivate at least one crop". A lot of sympathetic clucking was heard from his village people.

*Vamanabhata* went on to narrate several finer details of the case about the amount of water received and the actual amount of paddy harvested. The paddy crop had already been harvested and threshed a few days earlier.

*Maniammai* gave her verdict after consulting the other jurors. "Divide the paddy crop according to the acreage of the two villages" she announced, "and share it so that no one goes hungry. We will appeal to the King's court to waive the taxes for both villages and if necessary supply grains from the granary".

A murmur of appreciation and acceptance swept through the *mandapam*. But *Nadalvan*, the headman of *Navalur* advanced an important argument. "We don't mind sharing the

harvest, but what about our labour? We were the ones who sowed, harvested and threshed the crop while the *Kulattur* people were twiddling their thumbs. Should we not be compensated for this?"

To this, *Vamanabhata* sprung up from his seat and said, "why didn't they ask us for help when they harvested their crop? We wouldn't have refused. They just went ahead and made it a fait accompli!"

*Maniammai* upheld the objections of the *Kulattur* headman. She again went into a huddle with the jurors. Coming to a decision quickly she declared, "We agree that the people of *Navalur* had invested their labour also. But they failed to take the help of the *Kulattur* people since the dispute over water overshadowed everything. So, the harvested paddy should be shared between the two villages in the proportion of the usual sowing area. However, during the next harvesting season, we recommend that ten persons from *Kulattur* assist the *Navalur* people in harvesting their crop".

A roar of applause greeted the decision of the jury and the two headmen embraced each other. With the water dispute settled, women and men from the two villages rushed towards each other eager to catch up with all the gossip that they had missed during the dispute.

The jury took their seats again to hear the next case.

(This story was inspired by the interview with Dr Kamala Sankaran in the last issue, "British colonialism and the Indian legal system"-- The Author)

*S Raghavan is the editor of the Ghadar Jari Hai Magazine. He has a deep interest in India's cultural, economic and social past, present and future*





# Ghadar Jari Hai

**Seek the Truth!**

“The 21st century belongs to India” – such a dream is enticing many Indians. But there are too many nagging doubts about the realism of such a prospect. How can India blossom if over half our population continues to be poor and miserable, with millions under-nourished and driven to early death? How can we embrace the future if so many regions and so many people are left behind or go from bad to worse even as the national income or GDP races ahead?

Ours is an ancient land and civilisation, and we have inherited a rich body of thought material from our past. Our forefathers gave the concept of zero to the world. Bordered by the Himalayas, the Arabian Sea, Indian Ocean and the Bay of Bengal, this sub-continent has had a long and rich experience with philosophy and theories of economy and statecraft. However, we suffer from the colonial legacy of negating our heritage. The leaders of independent India in 1947 chose to retain the foundations of the British Indian state and the colonial notion of trusteeship. They chose not to make a break with the past, but to prolong its life. The perpetuation of European institutions and concepts of peace, order and good government, complemented by the so-called free market reforms in the present period, has led to an acute and deepening crisis of values in Indian society.

The times are calling on enlightened Indian minds to make a clean break with the colonial legacy and with all forms of backwardness from the past. The need of the hour is to elaborate and develop modern Indian thought – philosophy, political and economic theory – so as to address the problem that stares us in the face. This is the problem of ending the arbitrariness of power and the colonial style plunder in new and varied forms. It is the problem of redefining the foundations and reconstituting the structure of the Indian polity and economy, based on modern Indian thought and consistent with the most advanced scientific knowledge internationally. This magazine, called *Ghadar Jari Hai*, is dedicated to this call of the times.

The struggle is alive for the Navnirman or reconstitution of India – on the basis of a modern definition of democracy, and the principle that the State is duty bound to ensure prosperity and protection for all. A prosperous future requires us to overcome the poverty of material conditions as well as the poverty of thought in command of social life. This magazine is a forum for advancing the struggle in the realm of ideas, which is linked closely with the struggle to open the door to progress for Indian society. The inaugural issue was devoted to the lessons of the *Ghadar* of 1857, in honour of the 150th anniversary of that historic milestone in the political life of South Asia.

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is an agreement. It is not a universal truth. If I have two stones and if I take up two more stones then I get four stones but if I break one of them into two then I get five stone pieces. So I have to be careful about them as universal truths. At a practical level there is no problem. Even if there is no formal agreement or legal frame work, I would simply say you broke the stone. An agreement is not a universal truth or ultimate truth.

**SK: What is the European view on standard of proof, etc.**

**Raju:** There is the Platonic depreciation of the empirical. Then there is the clerical elevation of metaphysics over the empirical. The clergy said the metaphysical is a higher truth than the empirical truth. That is fallacious. Metaphysics is decided by a coterie.

**SK: One last comment. Many mathematicians have objections to the way the Indian mathematical results are written in the form of a *sutra* without explain-**

**ing how they arrived at it. Is there any insight into how they achieved these results? Secondly, we know of one person who wrote many results, filling up many note books, which are still being researched, viz Srinivasan Ramanujan, though it was in the field of mathematical analysis in the western tradition.**

**Raju:** I am not arguing for an absence of process. To question the value of axiomatic, deductive proof is one thing, and to say that there should be complete absence of process is another thing. A *sutra* has to be terse to make it easy to remember. It is a cultural matter, in the oral tradition, that communication should be from one mind to another and not filtered through a derivation on a dead parchment, where it is liable to be misunderstood. Right or wrong that is the tradition. However, it is not a critical issue as far as validity of the result is concerned. It is a pedagogical matter. Certainly a process has to be there and a justification [*pramana*] has to be there.

The first text book on philosophy that I picked up from my father said, there is no philosophical tradition in India but only poetry! For philosophy you have to read the Greeks! So now I can say that there is no mathematical tradition in Europe and it is all theology which was imported here through colonialism!

I would say a religious belief is being universalized and I find it highly objectionable. I would say, in fact, that our principles are universal since they are empirical and physical. I would characterize present-day mathematics as European ethnomathematics tainted by theology.

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*Dr C K Raju is a mathematician, historian and philosopher and has made important contribution through many articles and monographs towards combating Eurocentric rendition of the history of Mathematics. He has particularly brought out the impact of theological controversies in Europe on revisionist history of mathematics.*



Statue of Aryabhata at the IUCAA, Pune.

## Vachanas of Akka Mahadevi

*Does the peacock leave the hills  
And play in the meadows?  
Does the swan shun the lake  
And seek shallow streams?  
Does the cuckoo sing  
Before the mango sprouts?  
Does the butterfly go  
To a flower bereft of fragrance?  
Tell me, my friends: can I  
Desire someone other than  
God Chennamallikarjuna?*

\*\*\*\*\*

*When you build a house in the mountains  
It will not do to be scared of wild animals.  
When you build a house on the ocean shore  
It will not do to be frightened by breaking waves.  
When you build a house in the marketplace  
It will not do to shy away from noise.  
Hear me Chennamallikarjunadeva  
Being born on earth it will not do  
To lose peace of mind by praise or blame.*

\*\*\*\*\*

*(Courtesy: Poets and Saints—Kannada Poetry—  
Selected and Translated by G S Amur, Writers Workshop, 2008)*

\*\*\*\*\*

**Akka Mahadevi** is among the best known of the 12th century *Veerashaiva Vachanakaras*. Her extraordinary life: forced marriage with king *Kaushika*, her breaking away from the king, family and even clothing, and her journey to *Kalyan* where she interacted with *Allama*, *Basavanna* and other *Veerashaiva Sharanas* (saints) and then on to *Srishaila* her final resting place, has fascinated millions. She has been an iconic figure among the women poets in Kannada because of her radical questioning of social mores, her intense longing for *Chennamallikarjuna* (Shiva) and high poetic quality of her *Vachanas* (poems). She boldly affirmed the individuality of a woman and successfully gained acceptance from her peer saints. Akka Mahadevi's life and work have become a source of inspiration to this day for all those fighting for the emancipation of women.